DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 4/28/2008 has been entered. Claims 1, 4, 6, and 8 are pending. Claims 10-16 are withdrawn.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1, 4, 6, and 8 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Applicant does not teach the executable logic required to perform the claimed functions.

Claim Rejections - 35 USC § 102/103

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 4, 6 and 8 are rejected under 35 U.S.C. 102(b) as being anticipated by OR, in the alternative, under 35 U.S.C. 103(a) as being unpatentable over DiPierno Bosco et al. (US 6,103,409.)

The instant claims are to a fuel cell stack comprising:

a fuel cell having an inlet, a flow field in fluid communication with said inlet and an outlet in fluid communication with said flow field;

a vaporized water source in fluid communication with said inlet; a differential pressure transducer repeatedly measuring a differential pressure across said flow field and generating a set of differential pressure signals; and

a controller in communication with said differential pressure transducer, said controller having executable logic for determining a differential pressure fluctuation parameter as a representative statistical value as a root-mean-square value from said set of differential pressure signals and control circuitry for controlling said vaporized water source in response to said differential pressure fluctuation parameter.

The instant claims are to a product, a fuel cell stack. The claims include intended use limitations and process steps. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. Further, MPEP 2113 states, "Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." Thus, the use of the claimed controller and the steps performed by the claimed controller do not limit the product claim. The controller only need be capable of performing the steps to read upon the claim.

DiPierno Bosco et al. (US 6,103,409) teaches a fuel cell stack comprising a fuel cell having an inlet, a flow field in fluid communication with said inlet and an outlet in fluid

communication with said flow field (see figure 1 and col. 3, line 65 to col. 5, line 37); a vaporized water source in fluid communication with said inlet (col. 1, lines 48-65; col. 2, lines 14-end); a differential pressure transducer for measuring a differential pressure across said flow field and generating a set of differential pressure signals (paragraph bridging cols. 4-5); and a controller in communication with said differential pressure transducer, said controller having executable logic for determining a differential pressure fluctuation parameter from said set of differential pressure signals and control circuitry for controlling said vaporized water source in response to said differential pressure fluctuation parameter (col. 5, line 1 to col. 6, line 25.) Computers, microprocessors and logic are disclosed.

The intended use limitations, such as "for determining a differential pressure fluctuation parameter as a representative statistical value as a representative statistical value as a root-mean-square value from said set of differential pressure signals" have been considered, but do not result in a structural difference with respect to the claimed invention. The controller is capable of determining a differential pressure fluctuation parameter as a representative statistical value as a representative statistical value as a root-mean-square value based on standard mathematical logic.

With regard to the process steps of intended use by the claimed logic, determination of patentability is based on the product itself. The prior art does not teach the process steps of intended use by the claimed logic, however, the product-by-process claims or the process steps included in the product claims are the same as or obvious from a product of the prior art.

If the claims are not considered anticipated, then it would have been obvious to one of ordinary skill in the art at the time of the invention to perform basic mathematical techniques that would be known to any person skilled in the art.

Response to Arguments

Applicant's arguments filed 9/27/2007 have been fully considered but they are not persuasive.

Rejection of claims under 35 U.S.C. 112, first paragraph. Applicants argue that the algorithm disclosed by Applicants relates to a pressure fluctuation based on a root-mean-square, which is a well-known mathematical expression within the skill set of one of ordinary skill in the art and further argues that sufficient structure may be provided when Applicants provide "all information necessary to perform the function, except for basic mathematical techniques that would be known to any person skilled in the pertinent art." Applicants assert that the executable logic is sufficiently disclosed in compliance with the enablement requirement. Applicant discloses that: "[t]he controller logic is provided in real-time computer 164 for execution in real-time computer 164. In this regard, controller logic 166 is also denoted as 'software' and/or a 'program' and/or an 'executable program' within real-time computer 164 as data schema holding data and/or formulae information and/or program execution instructions. Controller logic 166 is, in a preferred embodiment, machine code resident in the physical memory storage of computer 164." Paragraph [0038]. Applicant goes on to disclose that in various embodiments, the controller logic captures the differential pressure measurement signals and executes a Fast-Fourier-Transform on the data. Paragraphs [0044]-[0046].

This argument is not persuasive. While applicant shows that the logic is provided in a real-time computer and is software or a program, the disclosure does not enable one of ordinary skill in the fuel cell art to make and use a fuel cell with executable logic for determining a differential pressure fluctuation parameter as a representative statistical value from said set of differential pressure signals. Further, the parameters and statistical values are not disclosed. Direction of determining these values are not disclosed. Applicant has not disclosed to one skilled in the art the algorithm noted in arguments, what logic is required, how to write such logic, what parameter is determined or what statistics are applied to obtain this value.

Rejection of claims under 35 U.S.C. § 102(b) OR under 35 U.S.C. § 103(a) as being unpatentable over DiPierno Bosco et al. (U.S. Patent No. 6,103,409.)

Applicant notes that DiPierno-Bosco et al. does not disclose Applicant's executable logic for determining a differential pressure fluctuation parameter as a representative statistical value from said set of differential pressure signals and accordingly the varied output actions of the fuel cell.

In response to applicant's argument that the references fail to show this feature of applicant's invention, it is noted that Applicant's executable logic for determining a differential pressure fluctuation parameter has not been disclosed as noted in the rejection under 35 U.S.C. 112. DiPierno-Bosco et al. disclose executable logic for determining a differential pressure fluctuation parameter as required by the claim since the reference teaches a controller including a computer or microprocessor with data input from the system. The statistics derived from the

computer program are not structural elements of the invention. Thus, the cited prior art anticipates the claimed subject matter.

Applicant further points out that the differential fluctuation parameter is different from the DiPierno Bosco et al. parameter because Applicant's parameter is based on the statistical root mean square of the pressure fluxuation determined from the executable logic. The statistical value from the executable logic allows for circuitry control and output based on, for example, a root-mean-square (rms) of the set, the variance, or the standard deviation.

This argument is not persuasive. The intended use limitation "for determining a differential pressure fluctuation parameter as a representative statistical value from said set of differential pressure signals" have been considered, but does not result in a structural difference with respect to the claimed invention. Structural weight is given to the fuel cell stack and to the controller, for example a computer, however, because the invention is to a product, patentable weight is not given to the data collected by the computer. MPEP 2114 states under the heading noted: APPARATUS CLAIMS MUST BE STRUCTURALLY DISTINGUISHABLE FROM THE PRIOR ART. While features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. In re Schreiber, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997.) MANNER OF OPERATING THE DEVICE DOES NOT DIFFERENTIATE APPARATUS CLAIM FROM THE PRIOR ART A claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ2d 1647 (Bd. Pat.

App. & Inter. 1987.) Therefore, the differential fluctuation parameter is not different, as claimed, from the DiPierno Bosco et al. parameter.

As noted in applicant's arguments (pages 6-7 of Applicants arguments filed 4/28/2008), the logic comprises well-known mathematical techniques that would be known to any person in the art. Thus, the structure is taught by the prior art and the data is manipulated by well-known mathematical techniques known in the art. Thus, the claimed structure is anticipated, and if weight is given to the manipulation of the data, then it would be considered obvious because the data is simply manipulated by well-known mathematical techniques known in the art.

Applicants respectfully point out that "a general purpose computer programmed to carry out a particular algorithm creates a 'new machine' because a general purpose computer 'in effect becomes a special purpose computer once it is programmed to perform particular functions pursuant to instructions from program software.'" This argument is not persuasive. The claimed invention does not include a computer programmed to carry out a particular algorithm.

Applicants' argue that the claimed invention provides sensitivity and speed of measurement which is not disclosed, taught by, or inherent in the DiPierno Bosco et al. system which is limited to measurements based on the reference fuel cell. This statement is not supported by evidence. The figures cited by applicant are not comparable and are not commensurate in scope with the claims. The claimed invention does not require a computer programmed to carry out a particular algorithm. The acts and results noted in the response are not structural claim limitations that are given patentable weight. The unique differential fluctuation parameter noted by Applicant has not been disclosed and the claims do not contain

limitations that reflect structure of a unique fuel cell that has not been taught in DiPierno Bosco. For these reasons, the claims stand rejected.

Examiner Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark Ruthkosky whose telephone number is 571-272-1291. The examiner can normally be reached on FLEX schedule (generally, Monday-Thursday from 9:00-6:30.) If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached at 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free.)

/Mark Ruthkosky/

Primary Examiner, Art Unit 1795